State of California
The Resources Agency
DEPARTMENT OF FISH AND GAME



# SOUTHERN CALIFORNIA INDEPENDENT SPORTFISHING SURVEY
# QUARTERLY REPORT NO. 6

by

Vickie L. Wine

MARINE RESOURCES

Administrative Report No. 77-10

March 1977

# SOUTHERN CALIFORNIA INDEPENDENT SPORTFISHING SURVEY [1]
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Vickie L. Wine [2]

## ABSTRACT

During the October 1 - December 31, 1976 quarter, 28 launch ramps, hoists, and boat rental locations were sampled a total of 182 times. During the sample days 8,299 anglers and 1,172 divers were interviewed. They expended 62,073 effort hours and landed 26,788 fishes of 149 species.

The ten most commonly landed species were: 1) white croaker, *Genyonemus lineatus*, 14%; 2) olive rockfish, *Sebastes serranoides*, 6%; 3) Pacific mackerel, *Scomber japonicus*, 5%; 4) rock scallop, *Hinnites multirugosus*, 4%; 5) bocaccio, *Sebastes paucispinis*, 4%; 6) copper rockfish, *S. caurinus*, 4%; 7) red abalone, *Haliotis rufescens*, 3%; 8) kelp bass, *Paralabrax clathratus*, 3%; 9) barred sand bass, *P. nebulifer*, 3%; and 10) ocean whitefish, *Caulolatilus princeps*, 3%.

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1/ Marine Resources Region, Administrative Report No. 77-10, March 1977.

2/ Marine Resources Region, California State Fisheries Laboratory, 350 Golden Shore, Long Beach, California 90802.

# SOUTHERN CALIFORNIA INDEPENDENT SPORTFISHING SURVEY
# QUARTERLY REPORT NO. 6

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## INTRODUCTION

This is the second year of the Southern California Independent Sportfishing Study conducted by the California Department of Fish and Game in cooperation with the National Marine Fisheries Service. The purposes of the study are to estimate effort levels expended by sport anglers and divers fishing from privately owned boats, to estimate the magnitude and species composition of their catch, and to determine the degree of sport fishermen's compliance with size limit regulations. This information is used to evaluate the impact of private boat sport fishermen on southern California's marine resources.

## OPERATIONS

The sampling plan consists of a program of random field sampling at the major launch ramps, hoists and boat rental locations from San Diego to Santa Barbara Counties. Sampling is conducted on all weekends and holidays, and on randomly chosen weekdays in accordance with available manpower. Field samplers remain at sampling locations from 1000 to 1800 hours, and an effort is made to interview all returning anglers and divers. Information on length of fishing trip, number of fishing poles used, and number of people angling or diving is gathered along with the identification and enumeration of all fishes, molluscs, crabs, and lobsters in possession (no data are requested about species caught but not kept). An attempt is made to measure all species with legal size requirements. Eight other species are also measured to provide data for life history studies.

Sampling sites are located in San Diego, Orange, Los Angeles, Ventura, and Santa Barbara Counties. During the quarter we sampled 18 launch ramps, 5 boat hoists, and 5 boat rental locations. One of the most heavily used launch ramps in San Diego County was closed for repairs beginning in October, and continued to be inoperative through December. We therefore added two previously unsampled launch ramps in the San Diego area to our list of sample sites. In mid-December the launch ramp at Cabrillo Beach, Los Angeles County, became inaccesible to fishermen due to the explosion of an oil tanker less than a half-mile away. The resulting oil spill and wreckage has rendered the launch unusable until clean-up operations have been completed.

Due to lack of funds, sampling was curtailed during the winter months. Weekend days were sampled in all counties, but weekdays were sampled only in Los Angeles and Orange Counties.

## RESULTS AND DISCUSSION

During the October 1 - December 31, 1976 quarter, 28 launch ramps, hoists, and boat rental locations were sampled a total of 182 times. During the sample days 8,299 anglers and 1,172 divers were interviewed. They expended 55,333 angler-trip-hours[1/] and 6,740 diver-trip-hours[1/], and landed 26,788 fishes of 149 species, and 2,138 unidentified filleted fishes (Table 1).

### Effort

Angler effort slacked off considerably as the summer vacation season ended. Effort levels for both weekdays and weekends were approximately half the summertime levels. Usually, cold winter weather and scarcity of surface fish species would account for the drop in angler effort. However, a warm water mass moved into the southern California

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1/ The unit of effort is 1 hour of trip time per angler or diver. Adjustments are made for those using more than one fishing pole concurrently.

TABLE 1. List of Species Sampled from Southern California Private Boats from October through December 1976.

Fishes

| Scientific name | Common name | No. sampled |
|---|---|---|
| *Alopias vulpinus* | thresher shark | 3 |
| *Amphistichus argenteus* | barred surfperch | 21 |
| *Anisotremus davidsonii* | sargo | 20 |
| *Anoplopoma fimbria* | sablefish | 149 |
| *Atherinops affinis* | topsmelt | 28 |
| *Atherinopsis californiensis* | jacksmelt | 98 |
| *Auxis rochei* | bullet mackerel | 4 |
| *Brachyistius frenatus* | kelp surfperch | 1 |
| *Caulolatilus princeps* | ocean whitefish | 744 |
| *Cephaloscyllium ventriosum* | swell shark | 1 |
| *Cheilotrema saturnum* | black croaker | 47 |
| *Chromis punctipinis* | blacksmith | 21 |
| *Citharichthys sordidus* | Pacific sanddab | 516 |
| *C. stigmaeus* | speckled | 12 |
| *C. xanthostigma* | longfin sanddab | 1 |
| *Cymatogaster aggregata* | shiner surfperch | 16 |
| *Cynoscion nobilis* | white seabass | 57 |
| *C. parvipinis* | shortfin corvina | 6 |
| *Damalichthys vacca* | pile surfperch | 24 |
| *Embiotoca jacksoni* | black surfperch | 352 |
| *E. lateralis* | striped surfperch | 12 |
| *Eopsetta jordani* | petrale sole | 11 |
| *Galeorhinus zyopterus* | soupfin shark | 3 |
| *Genyonemus lineatus* | white croaker | 3,713 |
| *Gibbonsia erythra* | scarlet kelpfish | 1 |
| *Girella nigricans* | opaleye | 198 |
| *Halichoeres semicinctus* | rock wrasse | 23 |
| *Heterodontus francisci* | horn shark | 2 |
| *Heterostichus rostratus* | giant kelpfish | 71 |
| *Hippoglossina stomata* | bigmouth sole | 6 |
| *Hydrolagus colliei* | ratfish | 5 |
| *Hyperprosopon argenteum* | walleye surfperch | 26 |
| *H. ellipticum* | silver surfperch | 4 |
| *Hypsopsetta guttulata* | diamond turbot | 25 |
| *Hypsurus caryi* | rainbow surfperch | 4 |
| *Hypsypops rubicundus* | garibaldi | 1 |
| *Isurus oxyrinchus* | bonito shark | 1 |
| *Lamna ditropis* | salmon shark | 1 |
| *Lepidopsetta bilineata* | rock sole | 2 |
| *Medialuna californiensis* | halfmoon | 384 |
| *Menticirrhus undulatus* | California corbina | 15 |
| *Merluccius productus* | Pacific hake | 52 |
| *Mola mola* | common mola | 1 |
| *Mustelus californicus* | gray smoothhound | 21 |
| *M. henlei* | brown smoothhound | 35 |
| *Myliobatis californica* | bat ray | 18 |
| *Neoclinus blanchardi* | sarcastic fringehead | 5 |
| *N. uninotatus* | onespot fringehead | 1 |

Table 1-cont.

| Scientific name | Common name | No. sampled |
|---|---|---|
| *Ophiodon elongatus* | lingcod | 167 |
| *Oxyjulis californica* | senorita | 31 |
| *Paralabrax clathratus* | kelp bass | 832 |
| *P. maculatofasciatus* | spotted sand bass | 157 |
| *P. nebulifer* | barred sand bass | 785 |
| *Paralichthys californicus* | California halibut | 273 |
| *Peprilus simillimus* | Pacific butterfish | 1 |
| *Phanerodon atripes* | sharpnose surfperch | 1 |
| *P. furcatus* | white surfperch | 125 |
| *Pimelometopon pulchrum* | California sheephead | 632 |
| *Platichthys stellatus* | starry flounder | 1 |
| *Platyrhinoidis triseriata* | thornback | 4 |
| *Porichthys notatus* | plainfin midshipman | 1 |
| *Prionace glauca* | blue shark | 125 |
| *Rhacochilus toxotes* | rubberlip surfperch | 51 |
| *Rhinobatos productus* | shovelnose guitarfish | 10 |
| *Roccus saxatilis* | striped bass | 13 |
| *Roncador stearnsii* | spotfin croaker | 119 |
| *Sarda chiliensis* | Pacific bonito | 417 |
| *Scomber japonicus* | Pacific mackerel | 1,391 |
| *Scorpaena guttata* | sculpin | 588 |
| *Scorpaenichthys marmoratus* | cabezon | 227 |
| *Sebastes alutus* | Pacific ocean perch | 1 |
| *S. atrovirens* | kelp rockfish | 561 |
| *S. auriculatus* | brown rockfish | 597 |
| *S. babcocki* | redbanded rockfish | 2 |
| *S. carnatus* | gopher rockfish | 130 |
| *S. caurinus* | copper rockfish | 955 |
| *S. chlorostictus* | greenspotted rockfish | 555 |
| *S. chrysomelas* | black & yellow rockfish | 78 |
| *S. constellatus* | starry rockfish | 338 |
| *S. dallii* | calico rockfish | 17 |
| *S. diploproa* | splitnose rockfish | 5 |
| *S. elongatus* | greenstriped rockfish | 233 |
| *S. ensifer* | swordspine rockfish | 10 |
| *S. entomelas* | widow rockfish | 52 |
| *S. flavidus* | yellowtail rockfish | 33 |
| *S. gilli* | bronzespotted rockfish | 1 |
| *S. goodei* | chilipepper | 299 |
| *S. helvomaculatus* | rosethorn rockfish | 2 |
| *S. hopkinsi* | squarespot rockfish | 25 |
| *S. lentiginosus* | freckled rockfish | 2 |
| *S. levis* | cowcod | 36 |
| *S. macdonaldi* | mexican rockfish | 10 |
| *S. melanostomus* | blackgill rockfish | 3 |
| *S. miniatus* | vermilion rockfish | 720 |
| *S. mystinus* | blue rockfish | 622 |
| *S. nigrocinctus* | tiger rockfish | 1 |
| *S. ovalis* | speckled rockfish | 58 |
| *S. paucispinis* | bocaccio | 1,032 |
| *S. pinniger* | canary rockfish | 65 |
| *S. rastrelliger* | grass rockfish | 336 |
| *S. rosaceus* | rosy rockfish | 247 |
| *S. rosenblatti* | greenblotched rockfish | 399 |

TABLE 1-cont.

| Scientific name | Common name | No. sampled |
|---|---|---|
| *Sebastes rubrivinctus* | flag rockfish | 217 |
| *S. rufus* | bank rockfish | 27 |
| *S. saxicola* | stripetail rockfish | 1 |
| *S. semicinctus* | halfbanded rockfish | 2 |
| *S. serranoides* | olive rockfish | 1,529 |
| *S. serriceps* | treefish | 98 |
| *S. simulator* | pinkrose rockfish | 2 |
| *S. umbrosus* | honeycomb rockfish | 131 |
| *Seriola dorsalis* | yellowtail | 2 |
| *Seriphus politus* | queenfish | 97 |
| *Sphyraena argentea* | California barracuda | 43 |
| *Squalus acanthias* | spiny dogfish | 82 |
| *Squatina californica* | sngel shark | 2 |
| *Stereolepis gigas* | giant seabass | 4 |
| *Strongylura exilis* | California needlefish | 6 |
| *Synodus lucioceps* | California lizardfish | 95 |
| *Tetrapturus audax* | striped marlin | 4 |
| *Thunnus alalunga* | albacore | 15 |
| *T. albacares* | yellowfin tuna | 8 |
| *T. thynnus* | bluefin tuna | 4 |
| *Trachurus symmetricus* | jack mackerel | 318 |
| *Triakus semifasciata* | leopard shark | 4 |
| *Umbrina roncador* | yellowfin croaker | 29 |
| *Urolopus halleri* | round stingray | 1 |
| *Xenistius californiensis* | salema | 2 |
| *Xystreurys liolepis* | fantail sole | 4 |
| *Sebastes* spp. | unidentified rockfish fillets | 2,050 |
| - - | unidentified fish fillets | 88 |

Molluscs and Crustaceans

| Scientific name | Common name | No. sampled |
|---|---|---|
| *Cancer anthonyi* | yellow crab | 7 |
| *C. antennarius* | rock crab | 80 |
| *C. productus* | red crab | 53 |
| *Cypraea spadicea* | chestnut cowry | 15 |
| *Haliotis assimilis* | threaded abalone | 2 |
| *H. corrugata* | pink abalone | 375 |
| *H. cracherodii* | black abalone | 156 |
| *H. fulgens* | green abalone | 365 |
| *H. rufescens* | red abalone | 894 |
| *H. sorenseni* | white abalone | 18 |
| *Hinnites multirugosus* | rock scallop | 1,153 |
| *Lottia gigantea* | owl limpet | 80 |
| *Megathura crenulata* | giant keyhole limpet | 1 |
| *Norrisia norrisi* | smooth turban snail | 1 |
| *Octopus bimaculatus* | twospot octopus | 16 |
| *Panulirus interruptus* | California spiny lobster | 595 |
| *Pisaster* spp. | sea star | 6 |
| *Strongylocentrotus franciscanus* | red urchin | 53 |
| *Tivella stultorum* | Pismo clam | 40 |
| *Ventricolaria fordii* | fords venus | 1 |
| Brachyura | unclassified spider crab | 9 |

coast area in late fall, resulting in very mild weather and the continued appearance of warm water fishes. Anglers who fish year-round noted these conditions and took advantage of them, while the "occasional" anglers who fish during the summer months only, were not aware of the unseasonally good fishing conditions this winter.

In contrast to angling effort, diving effort rose sharpely in October as the season opened for California spiny lobster, *Panulirus interruptus*, and diving effort remained high throughout the quarter.

The ratio of weekday to weekend activity remained the same as during the summer season: effort levels were four times greater on a Saturday or Sunday than on any weekday.

## Catch

Nearly 46% of the catch was composed of rockfishes, *Sebastes* spp., this quarter, including the 2,050 rockfishes which were landed in a filleted form which made species identification doubtful. Samplers identified 149 species of fishes, molluscs, and crustaceans, of which 51 species accounted for 94% of the catch (Table 2). The remaining 6% was composed of 1,522 fishes, molluscs, and crustaceans of 98 species.

The ten most commonly landed species were: 1) white croaker, *Genyonemus lineatus*, 14%; 2) olive rockfish, *Sebastes serranoides*, 6%; 3) Pacific mackerel, *Scomber japonicus*, 5%; 4) rock scallop, *Hinnites multirugosus*, 4%; 5) bocaccio, *Sebastes paucispinis*, 4%; 6) copper rockfish, *S. caurinus*, 4%; 7) red abalone, *Haliotis rufescens*, 3%; 8) kelp bass, *Paralabrax clathratus*, 3%; 9) barred sand bass, *P. nebulifer*, 3%; and 10) ocean whitefish, *Caulolatilus princeps*, 3%.

Santa Barbara County anglers landed mainly rockfishes, but Pacific mackerel was the most frequently landed single species. There was a great deal of diving activity in this area, and divers brought in large catches of rock scallops and red abalones.

TABLE 2. Most Commonly Landed Species During October - December, 1976.

Fishes

| Scientific name | Common name | No. sampled |
|---|---|---|
| *Genyonemus lineatus* | white croaker | 3,713 |
| *Sebastes serranoides* | olive rockfish | 1,529 |
| *Scomber japonicus* | Pacific mackerel | 1,391 |
| *Sebastes paucispinis* | bocaccio | 1,032 |
| *S. caurinus* | copper rockfish | 955 |
| *Paralabrax clathratus* | kelp bass | 832 |
| *P. nebulifer* | barred sand bass | 785 |
| *Caulolatilus princeps* | ocean whitefish | 744 |
| *Sebastes miniatus* | vermilion rockfish | 720 |
| *Pimelometopon pulchrum* | California sheephead | 632 |
| *Sebastes mystinus* | blue rockfish | 622 |
| *S. auriculatus* | brown rockfish | 597 |
| *Scorpaena guttata* | sculpin | 588 |
| *Sebastes atrovirens* | kelp rockfish | 561 |
| *S. chlorostictus* | greenspotted rockfish | 555 |
| *Citharichthys sordidus* | Pacific sanddab | 516 |
| *Sarda chiliensis* | Pacific bonito | 417 |
| *Sebastes rosenblatti* | greenblotched rockfish | 399 |
| *Medialuna californiensis* | halfmoon | 384 |
| *Embiotoca lateralis* | black surfperch | 352 |
| *Sebastes constellatus* | starry rockfish | 338 |
| *S. rastrelliger* | grass rockfish | 336 |
| *Trachurus symmetricus* | jack mackerel | 318 |
| *Sebastes goodei* | chilipepper | 299 |
| *Paralichthys californicus* | California halibut | 273 |
| *Sebastes rosaceus* | rosy rockfish | 249 |
| *S. elongatus* | greenstriped rockfish | 233 |
| *Scorpaenichthys marmoratus* | cabezon | 227 |
| *Sebastes rubrivinctus* | flag rockfish | 217 |
| *Girella nigricans* | opaleye | 198 |
| *Ophiodon elongatus* | lingcod | 167 |
| *Paralabrax maculatofasciatus* | spotted sand bass | 157 |
| *Anoplopoma fimbria* | sablefish | 149 |
| *Sebastes umbrosus* | honeycomb rockfish | 131 |
| *S. carnatus* | gopher rockfish | 130 |
| *Prionace glauca* | blue shark | 125 |
| *Phanerodon furcatus* | white surfperch | 125 |
| *Roncador stearnsii* | spotfin croaker | 119 |
| *Atherinopsis californiensis* | jacksmelt | 98 |
| *Sebastes serriceps* | treefish | 98 |
| *Seriphus politus* | queenfish | 97 |
| *Synodus lucioceps* | lizardfish | 95 |
| *Squalus acanthias* | spiny dogfish | 82 |

TABLE 2 - cont.

Molluscs and Crustaceans

| Scientific name | Common name | No. sampled |
|---|---|---|
| *Hinnites multirugosus* | rock scallop | 1,153 |
| *Haliotis rufescens* | red abalone | 894 |
| *Panulirus interruptus* | California spiny lobster | 594 |
| *Haliotis corrugata* | pink abalone | 375 |
| *H. fulgens* | green abalone | 365 |
| *H. cracherodii* | black abalone | 140 |
| *Cancer antennarius* | rock crab | 80 |
| *Lottia gigantea* | owl limpet | 80 |

Rockfishes predominated the catch for Ventura County also, but white croaker; Pacific sanddabs, *Citharichthys sordidus;* ocean whitefish; and kelp bass were taken in substantial numbers. Divers landed lobsters; rock scallops; red abalones; pink abalones, *Haliotis corrugata;* green abalones, *H. fulgens;* and California sheephead, *Pimelometopon pulchrum.*

In Los Angeles County 33% of the catch was composed of rockfishes, 25% of white croaker, and 12% of preferred game species (Pacific bonito, *Sarda chiliensis;* barracuda, *Sphyraena argentea;* California halibut, *Paralichthys californicus;* and bass, *Paralabrax* spp.).

The Orange County catch was composed mainly of surface fishes (Table 3) such as bass; white croaker; spotfin croaker, *Roncador stearnsii;* and black surfperch, *Embiotoca jacksoni.*

White croaker was the most frequently landed fish in San Diego County. Many anglers searched for marlin, but few were successful. Divers were able to land good catches of red and green abalones, rock scallops, and California sheephead.

## Catch-Per-Unit-of-Effort

The catch-per-unit-of-effort (CPUE) values for anglers ranged from 0.16 to 1.08 fish/angler-trip-hour (Table 4). The best catch successes were in Santa Barbara and Ventura Counties, where the average CPUE values were 0.82 and 0.66 respectively. Los Angeles County anglers enjoyed an overall CPUE of 0.47 fish/angler-trip-hour, but Orange County

TABLE 3. Ten Most Commonly Landed Species in Each County, October - December 1976.

| County | Rank | Scientific name | Common name |
|---|---|---|---|
| Santa Barbara | 1. | *Scomber japonicus* | Pacific mackerel |
| | 2. | *Hinnites multirugosus* | rock scallop |
| | 3. | *Haliotis rufescens* | red abalone |
| | 4. | *Sebastes caurinus* | copper rockfish |
| | 5. | *S. auriculatus* | brown rockfish |
| | 6. | *Panulirus interruptus* | California spiny lobster |
| | 7. | *Sebastes serranoides* | olive rockfish |
| | 8. | *S. atrovirens* | kelp rockfish |
| | 9. | *S. mystinus* | blue rockfish |
| | 10. | *Paralabrax clathratus* | kelp bass |
| Ventura | 1. | *Sebastes caurinus* | copper rockfish |
| | 2. | *Hinnites multirugosus* | rock scallop |
| | 3. | *Genyonemus lineatus* | white croaker |
| | 4. | *Sebastes paucispinis* | bocaccio |
| | 5. | *Citharichthys sordidus* | Pacific sanddab |
| | 6. | *Sebastes auriculatus* | brown rockfish |
| | 7. | *S. serranoides* | olive rockfish |
| | 8. | *S. mystinus* | blue rockfish |
| | 9. | *S. chlorostictus* | greenspotted rockfish |
| | 10. | *Haliotis corrugata* | pink abalone |
| Los Angeles | 1. | *Genyonemus lineatus* | white croaker |
| | 2. | *Scomber japonicus* | Pacific mackerel |
| | 3. | *Sebastes serranoides* | olive rockfish |
| | 4. | *S. paucispinis* | bocaccio |
| | 5. | *Sarda chiliensis* | Pacific bonito |
| | 6. | *Medialuna californiensis* | halfmoon |
| | 7. | *Scorpaena guttata* | sculpin |
| | 8. | *Paralabrax clathratus* | kelp bass |
| | 9. | *Embiotoca jacksoni* | black surfperch |
| | 10. | *Sebastes miniatus* | vermilion rockfish |
| Orange | 1. | *Genyonemus lineatus* | white croaker |
| | 2. | *Paralabrax nebulifer* | barred sand bass |
| | 3. | *Embiotoca jacksoni* | black surfperch |
| | 4. | *Paralabrax clathratus* | kelp bass |
| | 5. | *Sebastes paucispinis* | bocaccio |
| | 6. | *S. rosenblatti* | greenblotched rockfish |
| | 7. | *Roncador stearnsii* | spotfin croaker |
| | 8. | *Hinnites multirugosus* | rock scallop |
| | 9. | *Paralabrax maculatofasciatus* | spotted sand bass |
| | 10. | *Sebastes goodei* | chilipepper |
| San Diego | 1. | *Genyonemus lineatus* | white croaker |
| | 2. | *Paralabrax nebulifer* | barred sand bass |
| | 3. | *Sebastes serranoides* | olive rockfish |
| | 4. | *Caulolatilus princeps* | ocean whitefish |
| | 5. | *Haliotis rufescens* | red abalone |
| | 6. | *Pimelometopon pulchrum* | California sheephead |
| | 7. | *Sebastes miniatus* | vermilion rockfish |
| | 8. | *Scorpaena guttata* | sculpin |
| | 9. | *Citharichthys sordidus* | Pacific sanddab |
| | 10. | *Hinnites multirugosus* | rock scallop |

TABLE 4. Angler Catch-Per-Unit-of-Effort*

| Location | County | CPUE |
|---|---|---|
| Gaviota | Santa Barbara | 1.08 |
| Santa Barbara | Santa Barbara | 0.82 |
| Cabrillo Beach | Los Angeles | 0.78 |
| Oxnard | Ventura | 0.67 |
| Ventura | Ventura | 0.63 |
| Golden Shore | Los Angeles | 0.63 |
| Dana Hoist | Orange | 0.54 |
| Paradise Cove | Los Angeles | 0.53 |
| Goleta | Santa Barbara | 0.50 |
| Sunset Aquatic Park | Orange | 0.43 |
| National City | San Diego | 0.43 |
| Marina Del Rey | Los Angeles | 0.38 |
| Marine Stadium | Los Angeles | 0.35 |
| Redondo Hoist | Los Angeles | 0.34 |
| Redondo Rental | Los Angeles | 0.34 |
| Glorietta Bay | San Diego | 0.34 |
| Chula Vista | San Diego | 0.34 |
| Oceanside | San Diego | 0.33 |
| Ski Beach | San Diego | 0.33 |
| Dana Basin | San Diego | 0.30 |
| Art's Landing | Orange | 0.28 |
| Dana Launch | Orange | 0.24 |
| De Anza | San Diego | 0.22 |
| Newport Dunes | Orange | 0.17 |
| Bayside | Orange | 0.16 |

* Number of fishes per angler-trip-hour

anglers averaged only 0.26 fish/angler-trip-hour. San Diego County anglers fared slightly better, with a CPUE value of 0.32.

The CPUE for divers ranged from 0.09 to 1.17 fish[2/]/diver-trip-hour (Table 5). Santa Barbara and Ventura County divers averaged 0.87 and 0.71 fish/diver-trip-hour, while those in Los Angeles and Orange Counties averaged 0.58 and 0.56 fish/diver-trip-hour. The CPUE value for divers in San Diego County was 0.67.

All average CPUE values for anglers and divers were higher this quarter than the preceeding summer quarter, with the exception of those for divers in Los Angeles and San Diego Counties.

## Length Frequencies

The proportion of sub-legal sized fishes rose slightly as compared to the previous quarter. Over 40% of the California halibut measured were short (Table 6), and the percentage of sub-legal bass landed ranged from 20 for kelp bass to 30 for spotted sand bass. Only 5 of the 39 California barracuda landed were legal sized, and only 4 of the 45 white seabass measured were longer than the minimum legal size.

The proportion of legal sized abalones landed during the quarter was approximately 90% for all species combined. The average for the preceeding quarter was 91%, and for the period July 1975 - June 1976 it was 90.5%. Of the 498 lobsters taken this quarter, only 22 were shorter than the minimum legal size.

The length frequency data shown in Figures 1-7 show the size range and proportion of sub-legal sized fish landed in the sample region during this quarter.

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2/ In this case the term "fish" includes finfishes, molluscs and crustaceans.

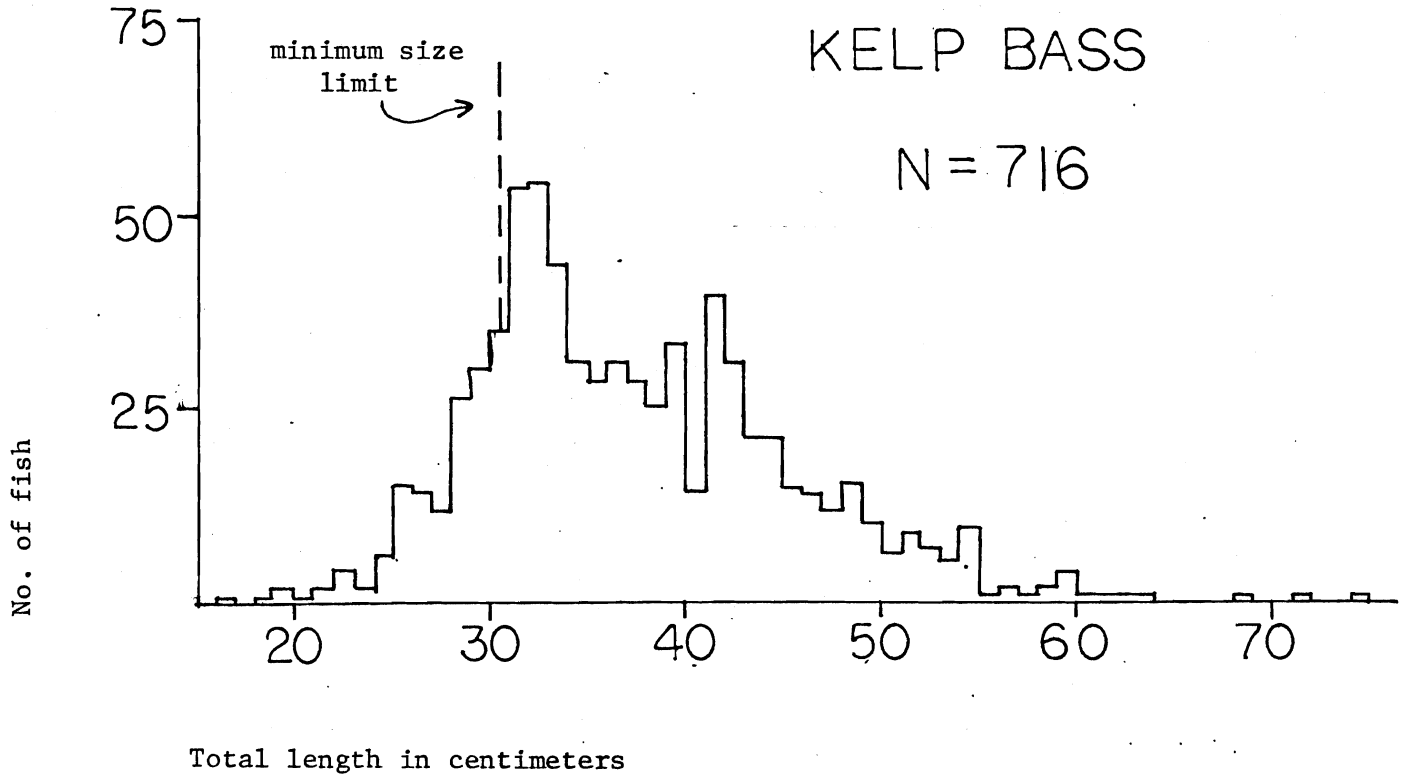
TABLE 5. Diver Catch-Per-Unit-of-Effort*

| Location | County | CPUE |
|---|---|---|
| Glorietta Bay | San Diego | 1.17 |
| Sunset Aquatic Park | Orange | 0.98 |
| Paradise Cove | Los Angeles | 0.95 |
| Gaviota | Santa Barbara | 0.89 |
| Chula Vista | San Diego | 0.89 |
| Santa Barbara | Santa Barbara | 0.88 |
| Cabrillo Beach | Los Angeles | 0.75 |
| De Anza | San Diego | 0.74 |
| National City | San Diego | 0.73 |
| Ventura | Ventura | 0.73 |
| Oxnard | Ventura | 0.70 |
| Dana Basin | San Diego | 0.69 |
| Goleta | Santa Barbara | 0.65 |
| Dana Launch | Orange | 0.64 |
| Newport Dunes | Orange | 0.60 |
| Redondo Hoist | Los Angeles | 0.59 |
| Ski Beach | San Diego | 0.54 |
| Golden Shore | Los Angeles | 0.47 |
| Art's Landing | Orange | 0.38 |
| Bayside | Orange | 0.38 |
| Marina del Rey | Los Angeles | 0.34 |
| Dana Hoist | Orange | 0.31 |
| Marine Stadium | Los Angeles | 0.14 |
| Oceanside | San Diego | 0.11 |
| Redondo Rental | Los Angeles | 0.09 |

* Number of fishes, molluscs, and crustaceans per diver-trip-hour.

TABLE 6. Occurrence of Sub-legal Fishes in Examined Catches.

| Scientific name | Common name | No. examined | % legal |
|---|---|---|---|
| | Fishes | | |
| *Cynoscion nobilis* | white seabass | 45 | 8.9 |
| *Paralabrax clathratus* | kelp bass | 716 | 80.4 |
| *P. maculatofasciatus* | spotted sand bass | 149 | 70.5 |
| *P. nebulifer* | barred sand bass | 649 | 87.1 |
| *Paralichthys californicus* | California halibut | 249 | 59.0 |
| *Sphyraena argentea* | California barracuda | 39 | 12.8 |
| | Molluscs and Crustaceans | | |
| *Haliotis corrugata* | pink abalone | 345 | 82.0 |
| *H. cracherodii* | black abalone | 150 | 100.0 |
| *H. fulgens* | green abalone | 272 | 97.8 |
| *H. rufescens* | red abalone | 858 | 88.5 |
| *H. sorenseni* | white abalone | 13 | 100.0 |
| *Panulirus interruptus* | California spiny lobster | 498 | 95.6 |



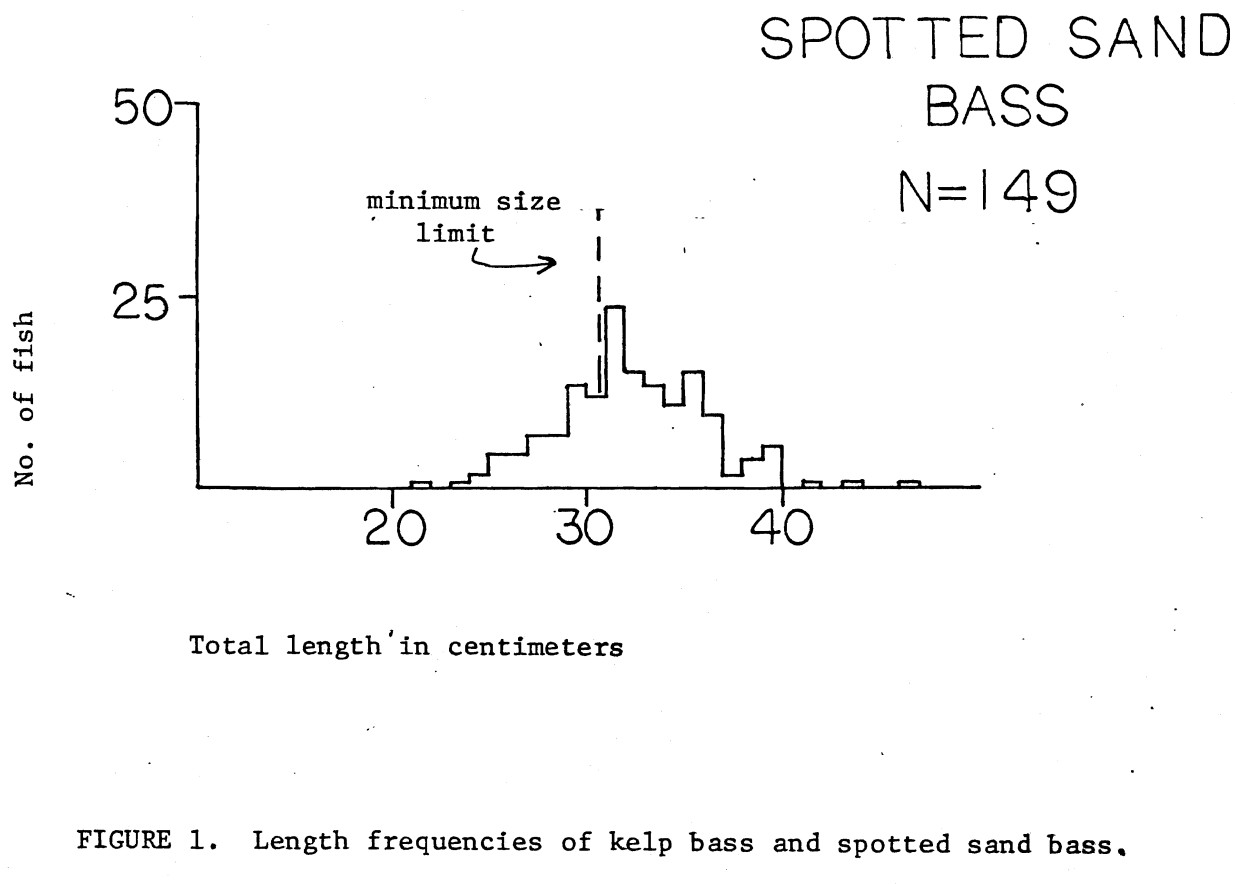




FIGURE 1. Length frequencies of kelp bass and spotted sand bass.

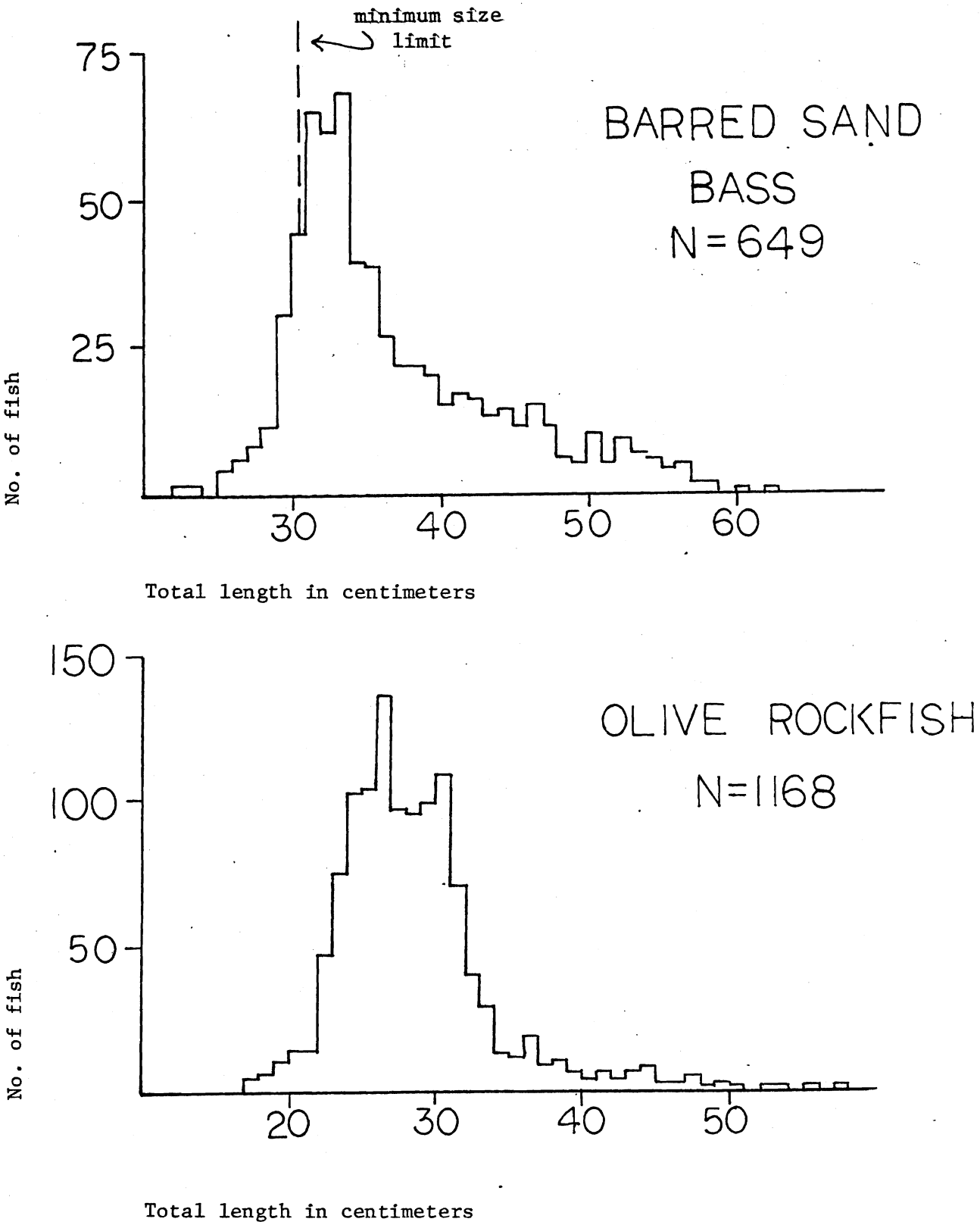



FIGURE 2. Length frequencies of barred sand bass and olive rockfish.

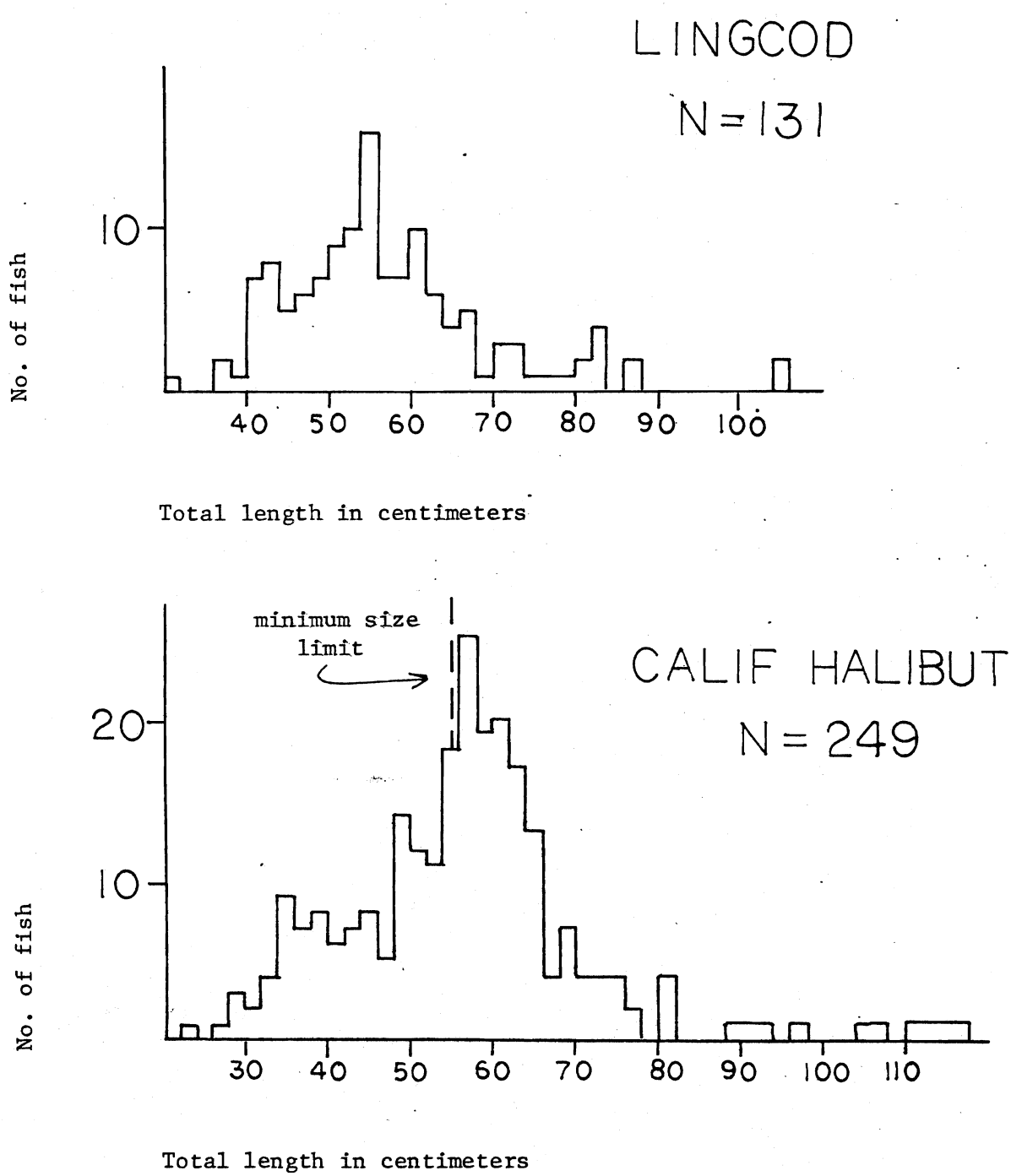



FIGURE 3. Length frequencies of California halibut and lingcod.

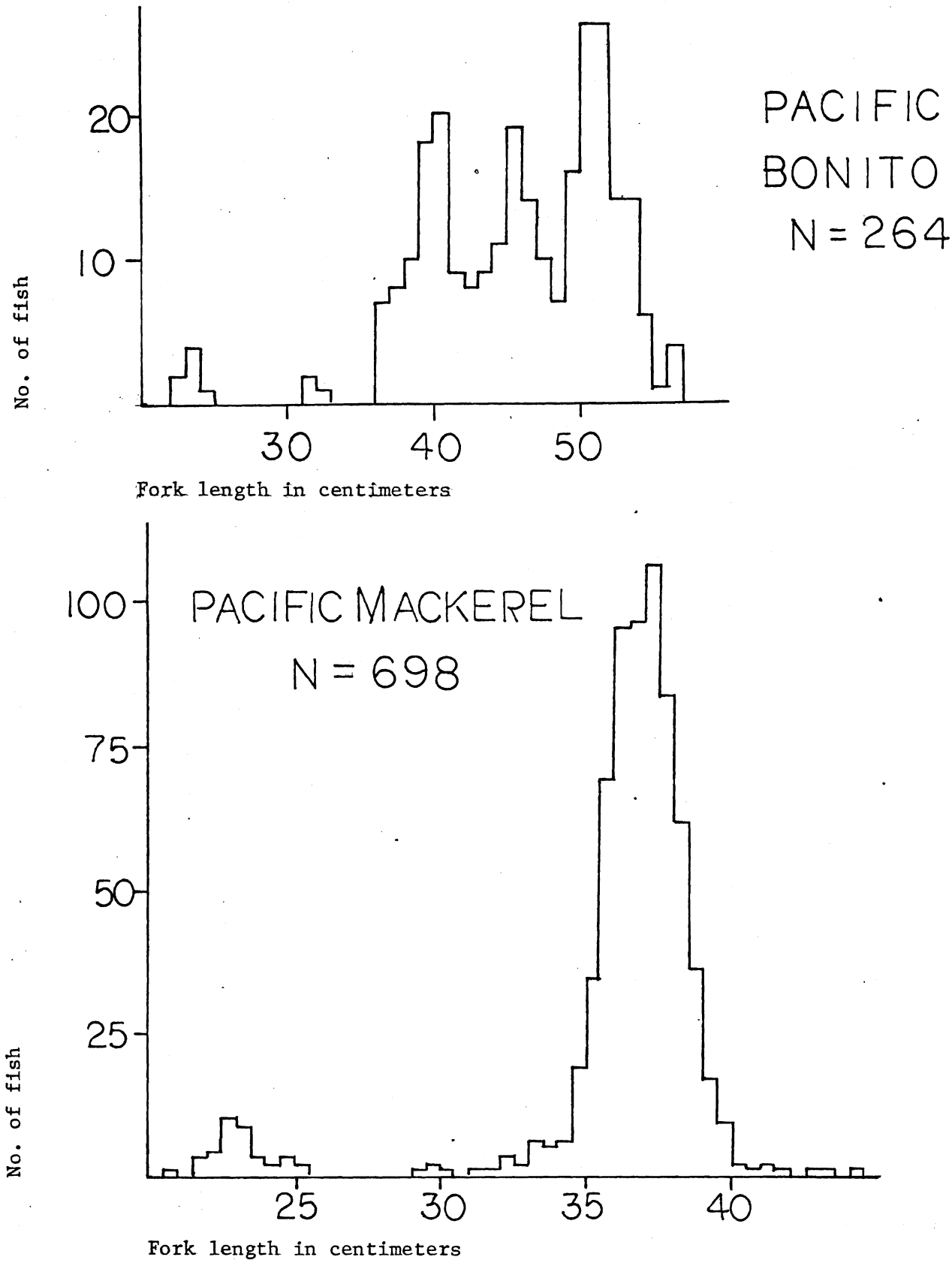
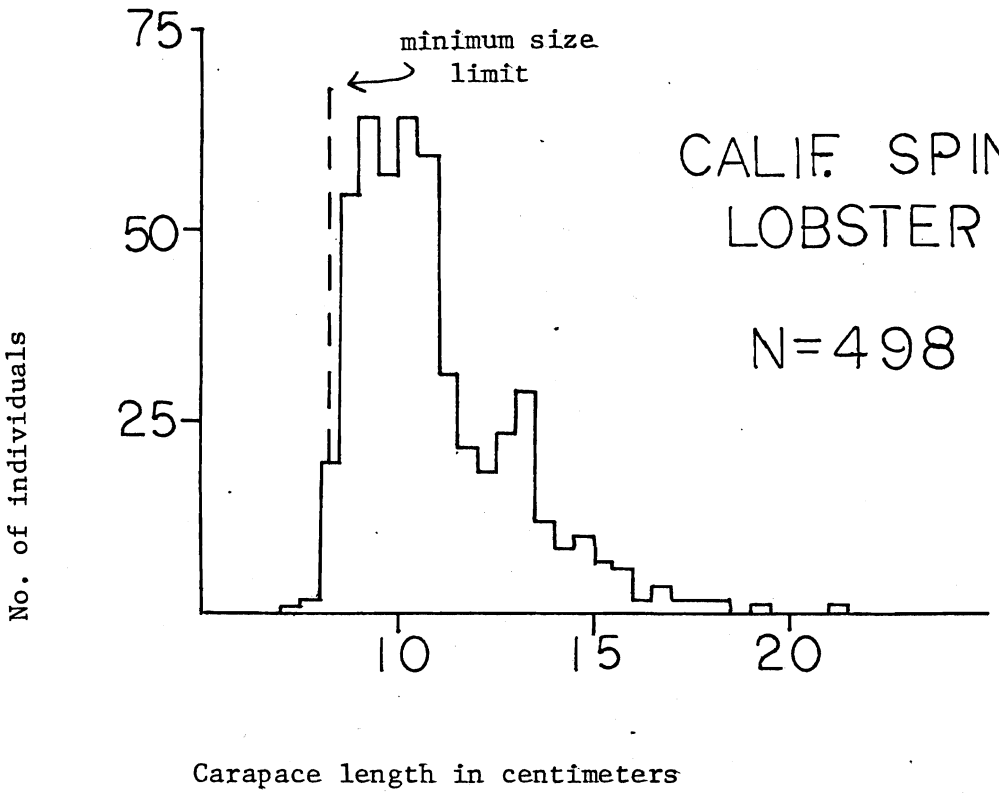



FIGURE 4. Length frequencies of Pacific bonito and Pacific mackerel.



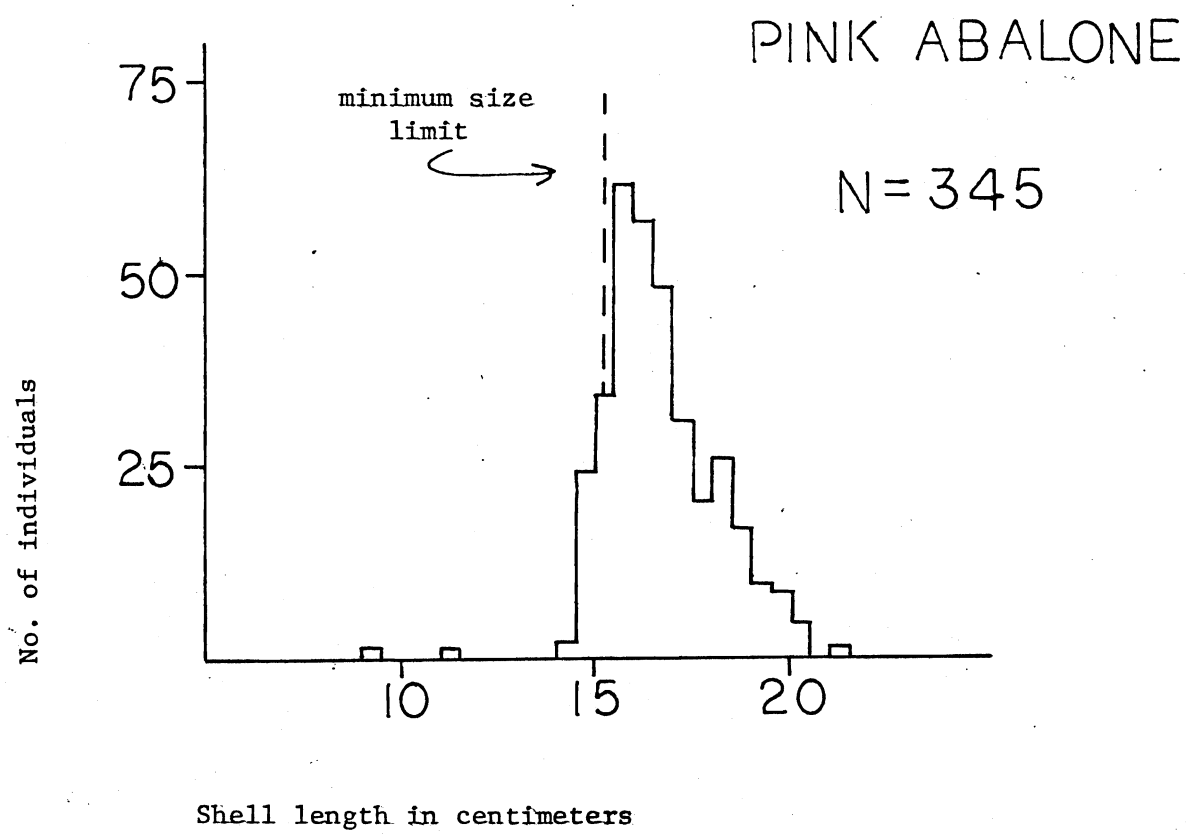




FIGURE 5. Length frequencies of California spiny lobster and pink abalone.

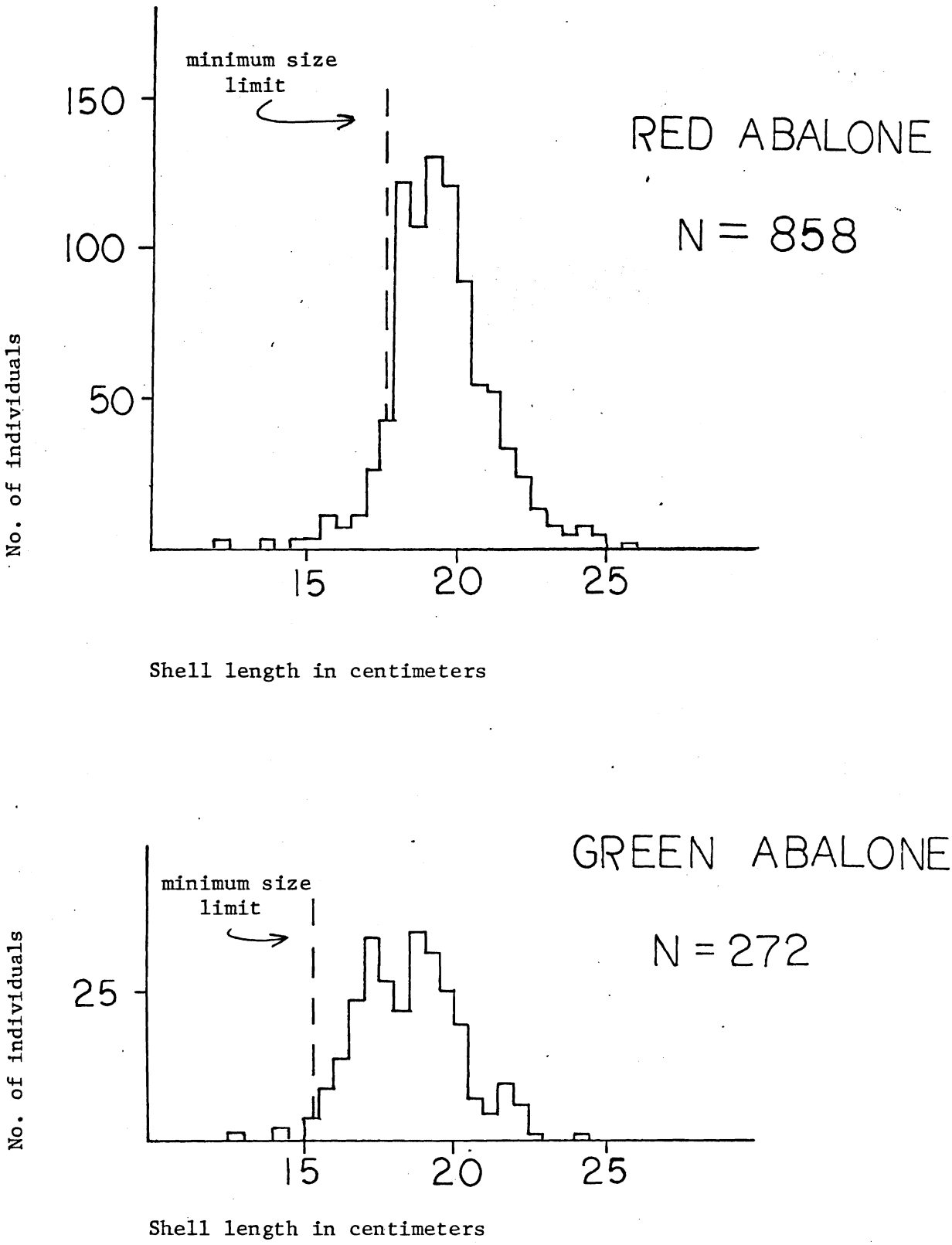



FIGURE 6. Length frequencies of red and green abalones.

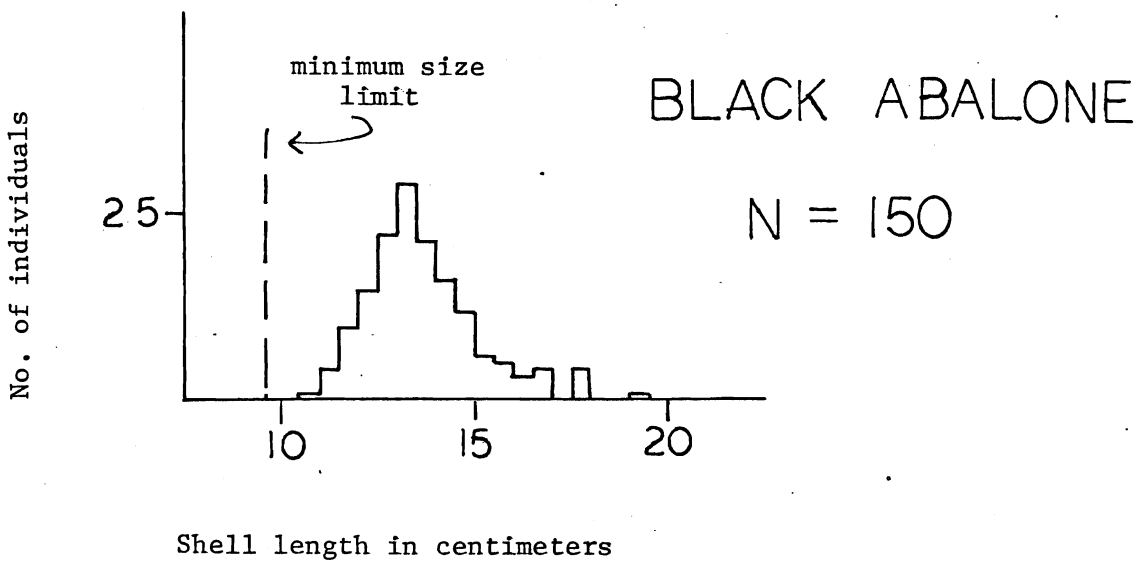



FIGURE 7. Length frequency of black abalone.